

Unconditioned Buildings

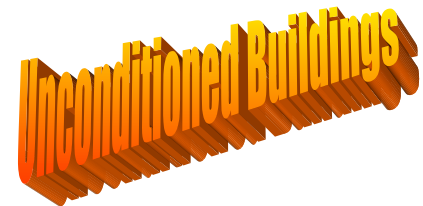
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Description

- Expand the scope of the Title 24 energy efficiency standards to unconditioned spaces.
 - Prescriptive LPD requirements.
 - Mandatory lighting control requirements.
- Unconditioned spaces are not currently regulated.



Design Criteria

- Existing CEC models of conditioned buildings work for unconditioned buildings, since the tasks are the same.
- No CEC model exists for parking garages, so a new one is developed.
 - IESNA 90.1 garage models use different calculation methods, but task, ambient area ratios, illuminances are the same.



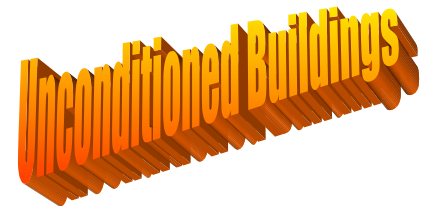
Design Criteria (cont.)

- 150 ft long by 50 ft wide by 9 ft tall garage section; diffuse reflectances of 0.30 ceiling, 0.30 walls, 0.20 floor to represent concrete.
- 50-fc task area, 10% of the space, for entrances and exits; 5-fc for remaining 90% actual parking area.



Lighting Equipment

- T8 second generation fluorescent lamp, electronic ballast shown cost effective; used for model.
- T5, metal halide, HPS alternate sources.
- Temperature effects on fluorescent sources a concern, but these lamps have wide use in California parking garages. Electronic ballasts eliminate starting problems.



Lighting Models-Existing

Area Categories- Commission models for spaces that may be unconditioned:

- Auto repair.
- Commercial and industrial storage.
- Corridors, restrooms, stairs, and support areas.
- Electrical, mechanical rooms.
- General commercial and industrial work:
 - High bay.
 - Low bay.
 - Precision.
 - o Kitchen, food preparation.
 - o Laundry.
 - o Locker/dressing room.
 - o Transportation facilities (baggage-ticket-waiting).

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Lighting Models-Existing

- **Complete Building Categories-** Commission models for spaces that may be unconditioned.
- General Commercial and Industrial Work Buildings:
 - High bay.
 - Low bay.
- Industrial and Commercial Storage Buildings.



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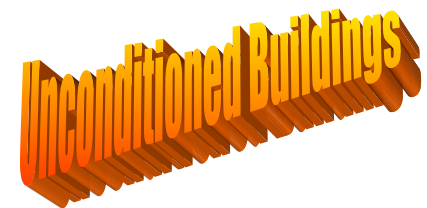
Lighting Model-New

CEC model uses lumen method to compute:

- Power needed for target average illuminance.
- Resulting Theoretical LPD.
- Recommended LPD rounded up to allow for design flexibility.

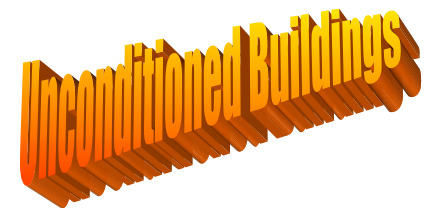
Result:

- Recommended Lighting Power Density: 0.30 Watts/ft²
 - Compare to IESNA 90.1 complete building recommendation: 0.35 W/ft²



Recommendations

- Modify section §100 and others so they do not exclude unconditioned buildings the energy standard: §130-132 for mandatory lighting controls and equipment, and §146 for prescriptive lighting requirements.
- Add new area category Parking Garage at 0.30 W/ft² to Table 1-N, Section §146.
- Add fifth paragraph in Section §150 (k) Lighting; if low-rise residential building includes a parking garage for eight or more motor vehicles, it must comply with lighting control requirements in Section §130.



Recommendations (cont.)

Definitions: *Parking Garage*

A building or structure intended for parking eight or more vehicles. A parking garage consists of at least a roof over the parking area, often with walls on one or more sides. It may have fences or rails in place of one or more walls. The structure has entrance(s) and exit(s), and includes areas for vehicle maneuvering to reach the parking spaces. If the roof of a parking structure is also used for parking, the section without an overhead roof is considered a parking lot instead of a parking garage.

